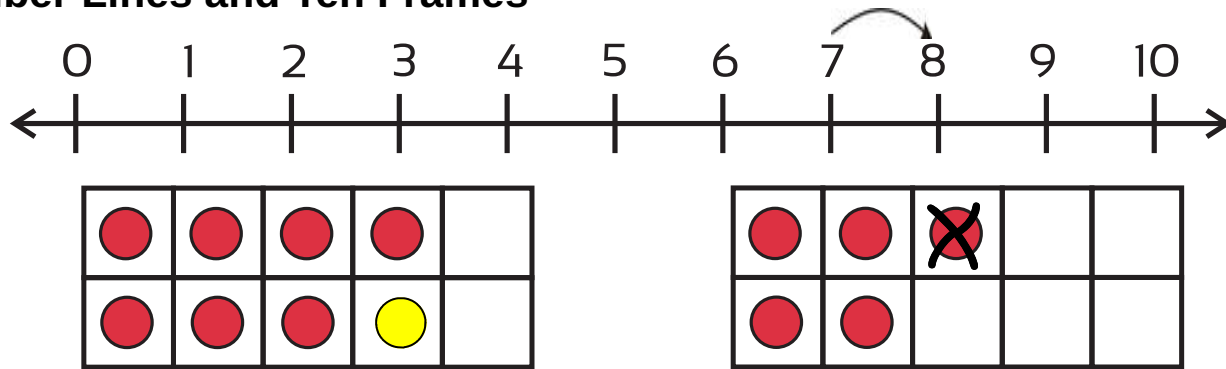## Overview Week 4

## Number Lines and Ten Frames



## Overview:

Number lines show numbers before and after, ten frames show the same concept as one more or one less.

### How to use a ten frames with the more or less concept:

Ensure students have access to their own ten frame and 2 different shades of counters*. Students will need 10 counters of one shade such as green, and at least 2 counters of another shade, such as red.
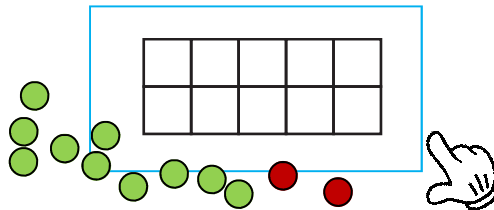


*Print attached sheet, cut in half and laminate. Ensure all students have their own set of counters and they are all the same shade such as green and 2 red ones..

Store individually in zip lock bags or containers.
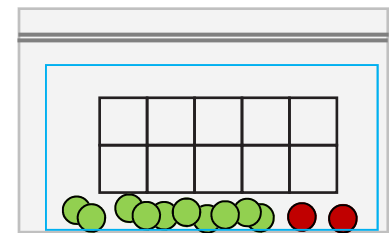


- Using two different shades for counters makes it much easier for students to visualise what is happening when there are more added. Establishing process for addition and subtraction without actually using the addition and subtraction sign can be more easily achieved this way.

- The different arrangements of the ten frames, pairs and rows, allow students to develop number sense in slightly different ways.

- **Pairs:** one more or less in the pairs arrangement shows how numbers alternate between odd and even. When adding 2 more to even numbers, the number remains even. Adding 2 more to odd the number remains odd.

- **Rows:** show numbers as growing in size, sometimes making a five (half ten) or making a ten. Some numbers will go from less than five to greater than five (such as 2 more than 4).

|  |  |  |  |  |
|--|--|--|--|--|
|  |  |  |  |  |
|  |  |  |  |  |

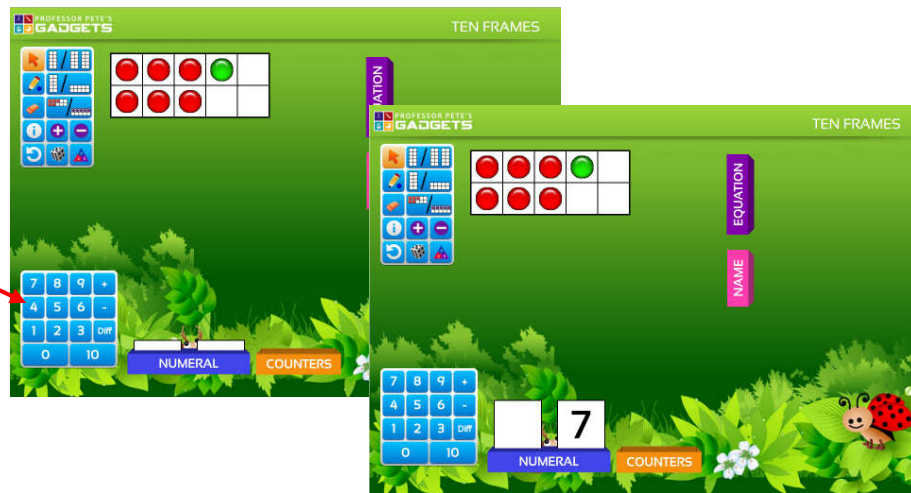|  |  |  |  |  |
|--|--|--|--|--|
|  |  |  |  |  |
|  |  |  |  |  |

## Using the Ten Frames Gadget to show 1 or 2 more, 1 or 2 less:

- Close EQUATION box as only the concept of addition or subtraction is being explored, not the written form as yet.

**More than:**

- Enter a number in the keypad.
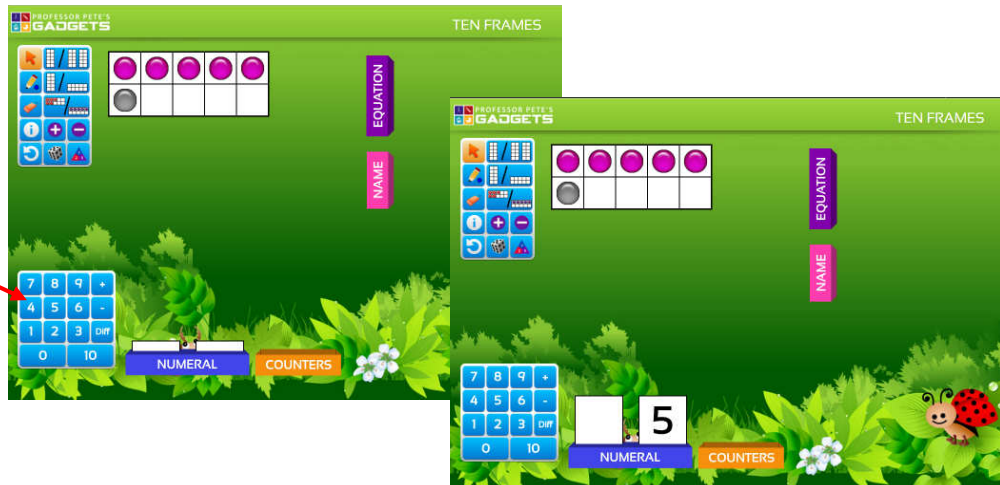
- Enter "+", then a number, such as "1"

**Key Pad:**
enter 6 + 1

## Using the Ten Frames Gadget to show less than:

- Enter a number on the keypad.

- Enter "–", then a number, such as "1". The number subtracted will grey out.

**Key Pad:**
enter 6 – 1

**PROFESSOR PETE'S GADGETS**
**TEN FRAMES**

**Using the Ten Frames Gadget to show the difference between:**

**NOTE: Some students may not be ready for this more <u>difficult concept</u>. If so leave it till later, perhaps till the end of the Numbers to 10 course. Teacher discretion used be used here.**

**Difference between two numbers:**

- **Note:** The difference between is an excellent way for students to become efficient in subtraction number facts when the numbers close together. It is much more difficult for numbers further apart. These facts with numbers close together, (e.g. 9–7), can be more easily remembered as a difference between than trying to count back 7, requiring the use of fingers.

## Gadget Setup:

- Close the EQUATION box as only the concept of difference between is being explored, not the written subtraction form as yet.

- Enter a large number in the keypad.

- Enter "Diff", then a number, one or two less. E.g. Difference between 9 and 8.

- Draw students attention to the two numbers 9 and 8 and where those numbers are in the image.

- Then identify the difference as being the one left over.

**Ten Frame:** the 9 counters

**Ten Frame:** the 8 counters overlaid
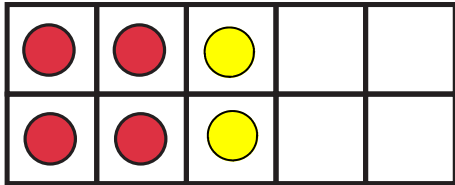
**Key Pad:** enter 9 Diff 8

**Answer:** the remaining counter

- Repeat with other numbers.

**PROFESSOR PETE'S GADGETS**

TEN FRAMES

**Use the ten frame to help you find one or two more than this number. Draw the dots. Write the answer.**

___ more than __4__ is  6

___ more than ____ is

___ more than ____ is

___ more than ____ is
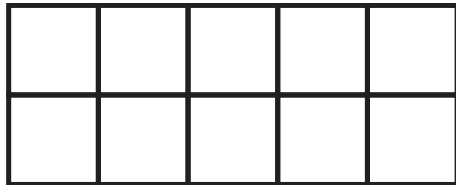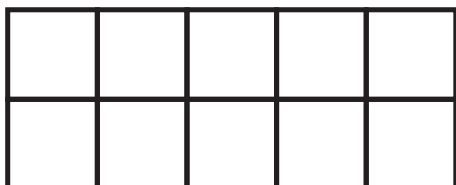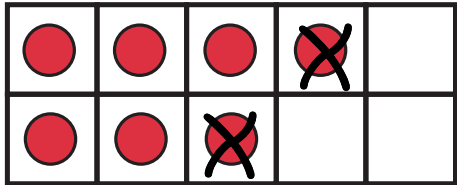
___ more than ____ is
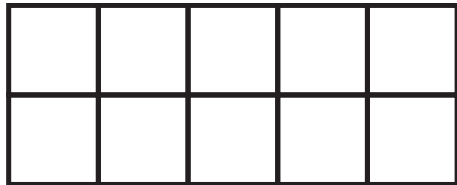
**PROFESSOR PETE'S GADGETS**

TEN FRAMES

**Template Instructions: :** Draw dots or numbers and have the students complete the rest.

**Use the ten frame to help you find one or two less than this number. Cross off one or two dots. Make sure you cross off the dots at the end.**
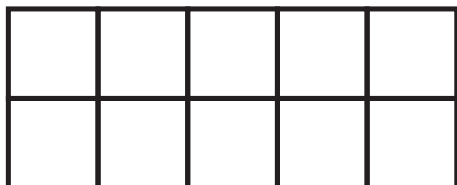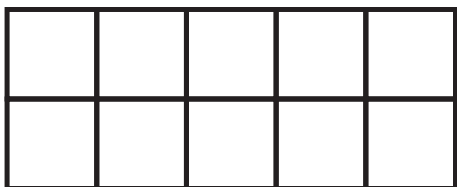
___ less than __7__ is [ 5 ]

___ less than ____ is [ ]

___ less than ____ is [ ]

___ less than ____ is [ ]

___ less than ____ is [ ]

**Use the number line to help you find the difference between these numbers.**

0   1   2   3   4   5   6   7   8   9   10

The difference between ___ and ___ is

The difference between ___ and ___ is

The difference between ___ and ___ is
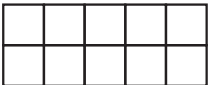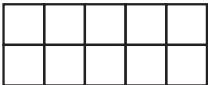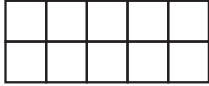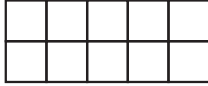
The difference between ___ and ___ is

The difference between ___ and ___ is

The difference between ___ and ___ is

The difference between ___ and ___ is
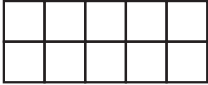
**Template Instructions:** Draw dots, write the number or write the number name on the line and have students complete the rest.

Use the number line to help you find the number after and the number before.

$$\longleftarrow \quad 0 \quad 1 \quad 2 \quad 3 \quad 4 \quad 5 \quad 6 \quad 7 \quad 8 \quad 9 \quad 10 \quad \longrightarrow$$

The number after _____ is

_____ is the number before _____

# Lesson 4A

**One more than with ten frames.**

Hand out ten frames and counters*.

**Note:** Before using the Ten Frames Gadget, make sure students do lots of hands on activities with their ten frames. The concept of adding one more needs to be established in their minds before moving to the more abstract ten frames on the screen. Students need to see that the counters are actually added on an that there are more of them. Using the Gadget, whilst showing students what is happening, is not a substitute for working with real concrete objects.

I**t is important to have students show numbers on their ten frame then find the number one more than.** Make sure they add the counter to continue the pattern or the arrangement, not just add them on any where. Using a different shade for the one more helps establish this adding concept in their minds.

Once this concept is established then move on to using the **Ten Frames Gadget.**

**Set the Ten Frames gadget to these settings.**

*Place Laminated ten frames and counters in bags. Ensure all students have their own set of counters and they are all the same shade such as green, blue etc It is necessary to add in two more counters of a different shade.

Store individually in zip lock bags or containers.
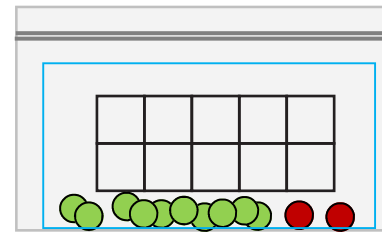
**Ten Frame**: single frame

**EQUATION:** hide it (close it)

**Tool Panel:** Check default settings
- Single ten frame
- Horizontal or vertical layout
- Set arrangement

**Key Pad:** for entering numbers  e.g. "5+1"

**NAME:** hide it (close it)

**NUMERAL:** hide or show the written form of the number

**COUNTERS:** hide or show the counters on the ten frames

# Lesson 4A Cont'd

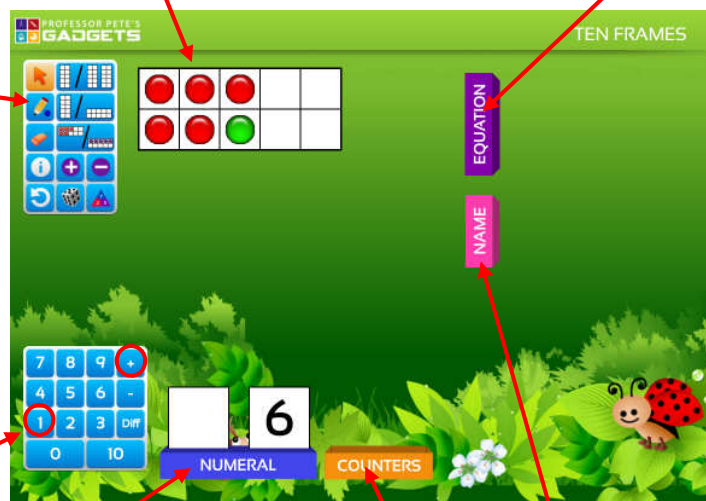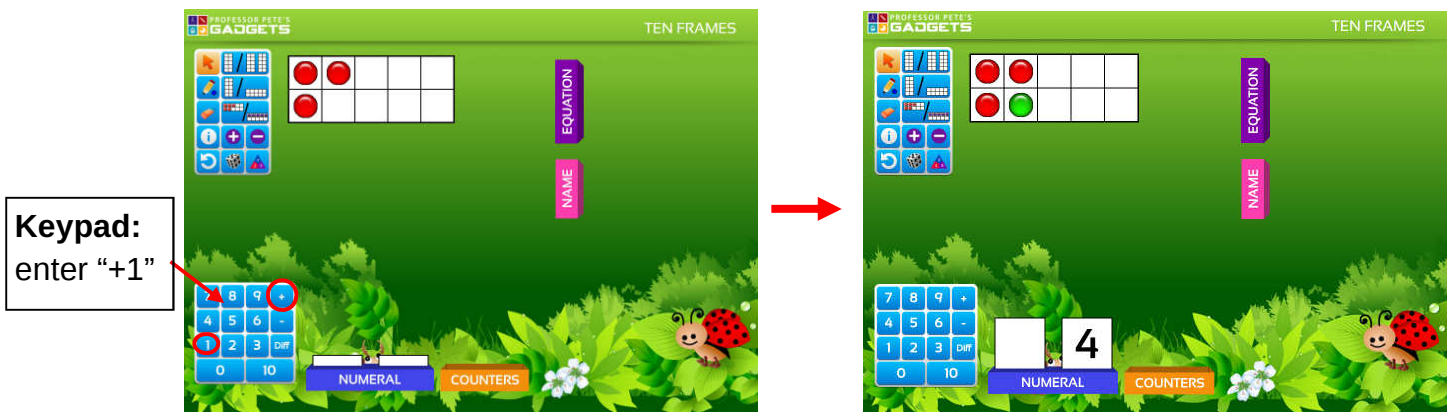- Close all boxes except keep the counters on screen.

- Enter a number from 0 to 9 in the keypad. (Use zero only after the concept has been established. Do not start with it)

- Ask students to say how many counters are on screen.

- Ask students what number is one more than __.

- Enter "+1" on the keypad and check the answer.

**Keypad:** enter "+1"



- Reset the screen.

- Repeat above steps with other numbers. Use the different layouts and arrangements.

- Ask students show you using their ten frames so they can count one more and touch the concrete materials. Make sure they use the different shaded counter so that they can clearly see the original number and then the number with one more added.

- **Worksheet activities:** Complete only some of them. Remember you do not need to do all the activities but choose the best ones most suitable for your students. Alternatively you could use the extra worksheets for early finishers.

**Use the ten frame to help you find two more than this number. Draw two more dots and write the number.**
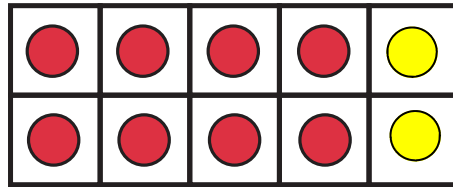
One more than __8__ is  | 10 |
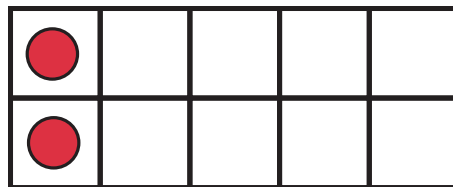
One more than __2__ is  [  ]
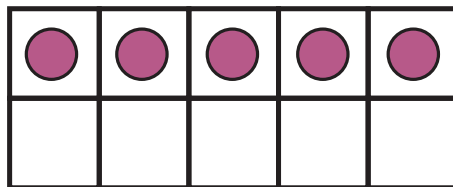
One more than __5__ is  [  ]
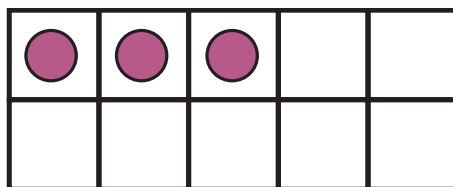
One more than __3__ is  [  ]

**PROFESSOR PETE'S GADGETS**

**Draw the dots in one shade and then add two more dots in a different shade to make a new number.**

One more than ___8___ is

One more than ___3___ is

One more than ___5___ is

One more than ___2___ is

**Draw the dots in one shade and then add two more dots in a different shade to make a new number.**

One more than __5__ is [ ]

One more than __0__ is [ ]

One more than __7__ is [ ]

One more than __4__ is [ ]

# Lesson 4B

**Two more than is introduced.**

Hand out ten frames and counters*.

**Note:** Before using the Ten Frames Gadget, make sure students do lots of hands on activities with their ten frames. The concept of adding two more needs to be established in their minds before moving to the more abstract ten frames on the screen.

**Finding two more than with ten frames:**

Set the Ten Frames gadget to these settings.

*Place Laminated ten frames and counters in bags. Ensure all students have their own set of counters and they are all the same shade such as green, blue etc It is necessary to add in two more counters of a different shade.

Store individually in zip lock bags or containers.
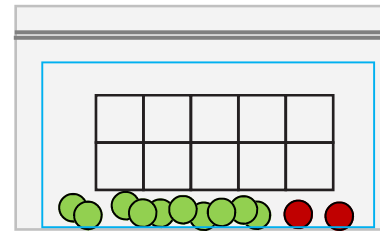
**Tool Panel:** Check default settings

- Single ten frame
- Horizontal or vertical layout
- Set arrangement

**Ten Frame**: single frame

**EQUATION:** hide it (close it)

**Key Pad:** for entering numbers  e.g. 5 + 2

**NUMERAL:** hide or show the written form of the number

**COUNTERS:** hide or show the counters on the ten frames

**NAME:** hide it (close it)

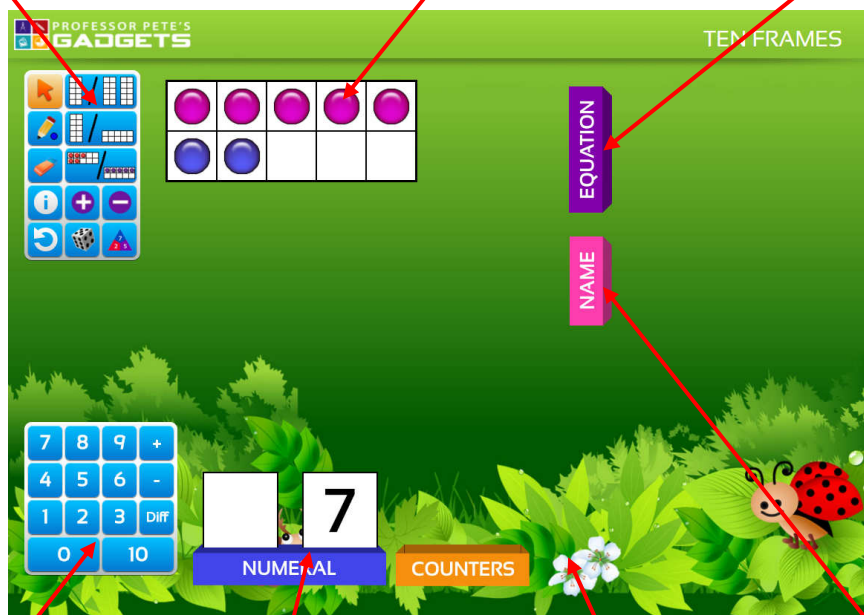# Lesson 4B Cont'd

- Close all boxes except keep the counters on screen.

- Enter a number from 0 to 8 in the keypad. (Use zero only after the concept has been established. Do not start with it)

- Ask students to say how many counters are on screen.

- Ask students what number is two more than __.

- Enter "+2" on the keypad and check the answer.

Enter "+2" here



- Reset the screen.

- Repeat above steps with other numbers. Use the different layouts and arrangements.

- Ask students show you using their ten frames so they can count two more. Make sure they use the different shaded counter so that they can clearly see the original number and then the number with one more added.

- **Worksheet activities:** Complete only some of them. Remember you do not need to do all the activities but choose the best ones most suitable for your students. Alternatively you could use the extra worksheets for early finishers.

Draw the counters, then add 2 more.

Two more than ___7___ is

Two more than ___5___ is

Circle the number two before 9

0   1   2   3   4   5   6   7   8   9   10

Two more than ___6___ is

Two more than ___3___ is

Two more than ___8___ is

Two more than ___2___ is

Draw the counters, then add 2 more.

Two more than ___6___ is

Two more than ___3___ is

Circle the number two after 7

0   1   2   3   4   5   6   7   8   9   10

Two more than ___8___ is

Two more than ___2___ is

Two more than ___7___ is

Two more than ___5___ is

**Try these without the number line. Count on 2.**

The number 1 after 6 is

The number 1 after 8 is

The number 2 after 5 is

The number 2 after 3 is

**Count on 2.**

is the number 1 after 7

is the number 2 after 5

is the number 2 after 4

is the number 2 after 0

# Lesson 4C

**One or two less than with ten frames.**

Hand out ten frames and counters*.

**Note:** Before using the Ten Frames Gadget, make sure students do lots of hands on activities with their ten frames. The concept of taking away needs to be established in their minds before moving to the more abstract ten frames on the screen. Students need to see that the counters are actually removed. They are gone. Greying out a counter, whilst showing students what is happening, is not a substitute for working with real concrete objects.

I**t is important to have students show numbers on their ten frame then find the number one less.** Make sure they remove the last counter on the frame, not one from the beginning or middle.

Once this concept is established then move on to using the Ten Frames Gadget.

*Place Laminated ten frames and counters in bags. Ensure all students have their own set of counters and they are all the same shade such as green, blue etc

Store individually in zip lock bags or containers.
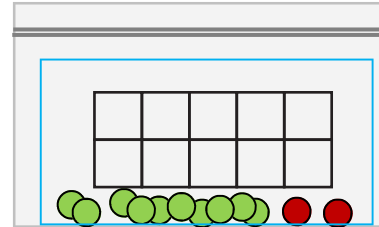
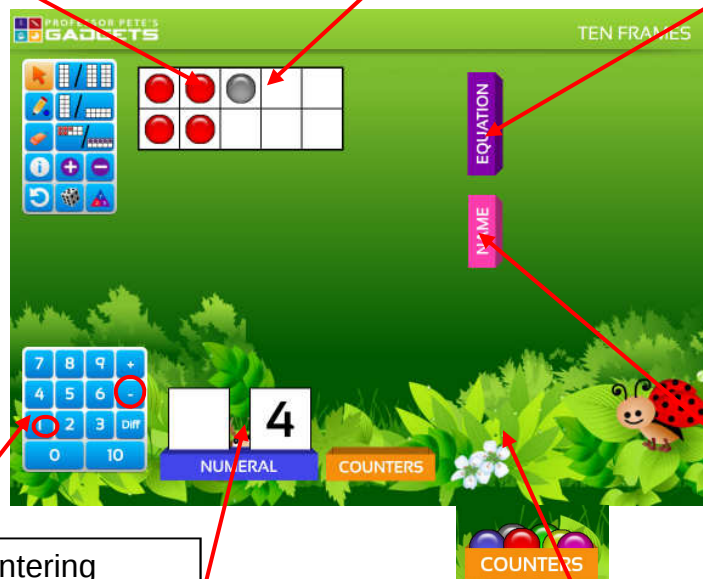**Tool Panel:** Check default settings
- Single ten frame
- Horizontal or vertical layout
- Set arrangement

Set the Ten Frames gadget to these settings.

**Ten Frame**: single frame

**EQUATION:** hide it (close it)

**Key Pad:** for entering numbers e.g. "5 – 1"

**NUMERAL:** hide or show the written form of the number

**COUNTERS:** hide or show the counters on the ten frames

**NAME:** hide it (close it)

# Lesson 4C Cont'd

**Using the Ten Frame Gadget:**

- Close all boxes except keep the counters on screen.

- Enter a number from 0 to 9 in the keypad. (Use zero only after the concept has been established. Do not start with it)

- Ask students to say how many counters are on screen.

- Ask students what number is one more than __.

- Enter "–1" on the keypad and check the answer.

Enter "–1" here
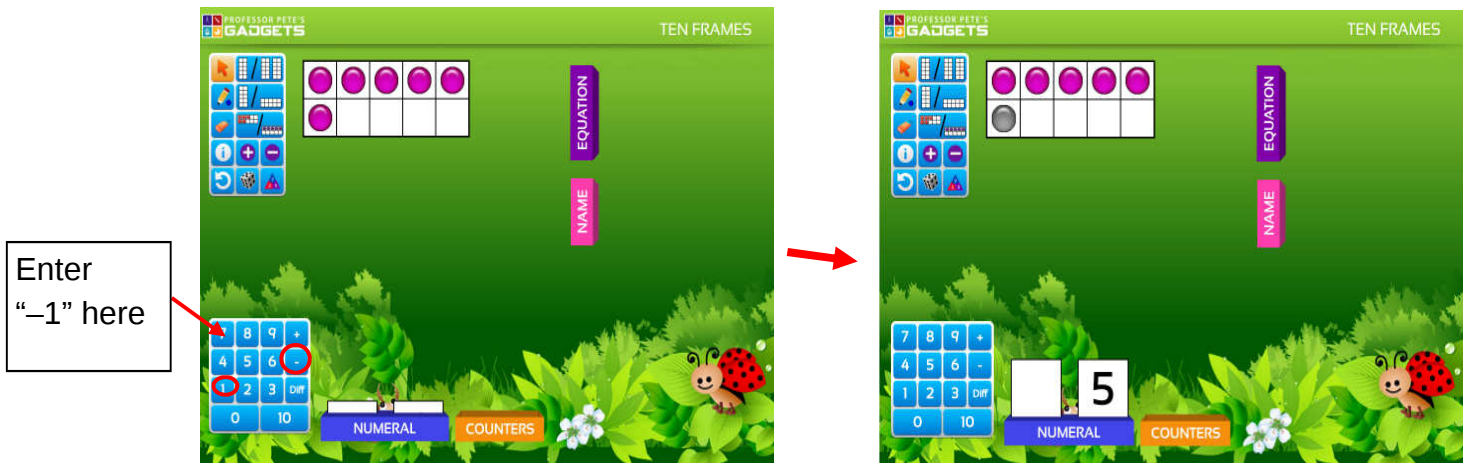


- Reset the screen.

- Repeat above steps with other numbers. Use the different layouts and arrangements.

- Ask students show you using their ten frames so they can physically remove one counter. Later repeat this step with removing 2 counters.

- Repeat above activity and when ready ask them to remove two counters to find two less than.

- **Worksheet activities:** Complete only some of them. Remember you do not need to do all the activities but choose the best ones most suitable for your students. Alternatively you could use the extra worksheets for early finishers.

**PROFESSOR PETE'S GADGETS**

**Use the ten frame to help you find one less than this number. Cross off one dot. Make sure you cross off the last dot.**
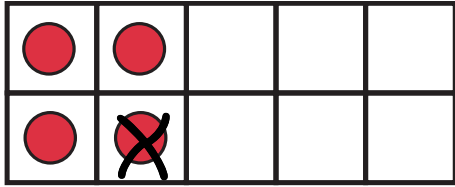
One less than __4__ is [ 3 ]

One less than __9__ is [ ]
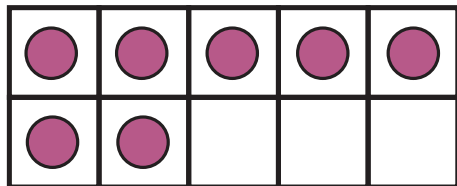
One less than __7__ is [ ]
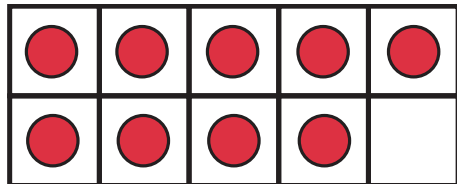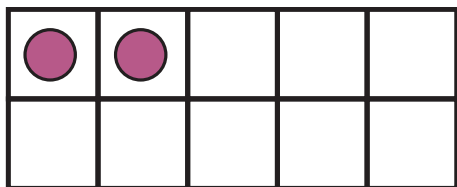
One less than __2__ is [ ]
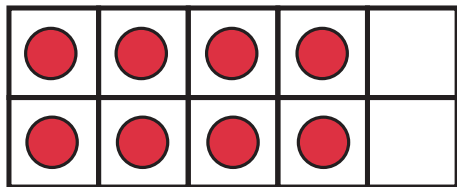
One less than __8__ is [ ]

Use the ten frame to help you find two less than this number.
Cross off two dots. Make sure you cross off the last dote.
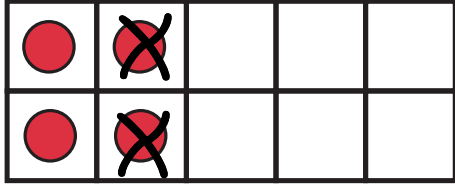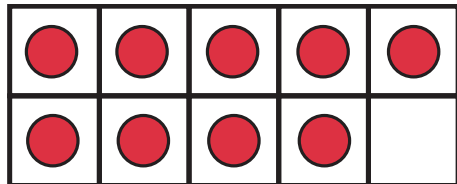
Two less than __4__ is [ 2 ]

Two less than __9__ is [   ]
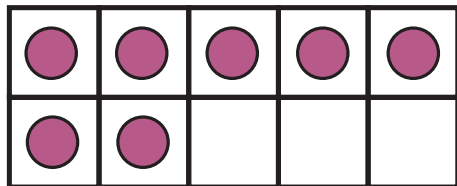
Two less than __7__ is [   ]
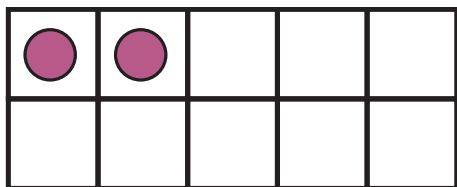
Two less than __2__ is [   ]
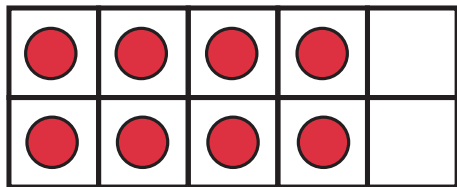
Two less than __8__ is [   ]

Use your ten frame and counters to help you find two less than each of the numbers.
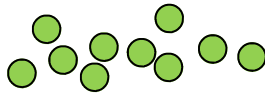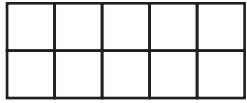
One less than __3__ is

Two less than __8__ is

One less than __2__ is

Two less than __7__ is

One less than __4__ is

Two less than __9__ is

One less than __5__ is

**PROFESSOR PETE'S GADGETS**

Use your ten frame and counters to help you find one or two less than each of the numbers.
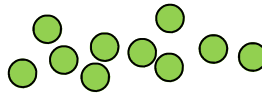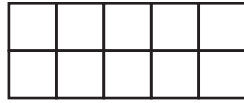
| | |
|---|---|
| One less than __6__ is | ☐ |
| Two less than __9__ is | ☐ |
| One less than __2__ is | ☐ |
| Two less than __10__ is | ☐ |
| One less than __5__ is | ☐ |
| Two less than __3__ is | ☐ |
| One less than __7__ is | ☐ |

## Lesson 4D

**The difference between two numbers.**

This concept is tricky for students. The two numbers have to be compare against each other and the answer is the difference (or the those that are left showing) between them.

Hand out ten frames and counters*.

Always use the ten frames and counters, the concrete materials, before using the Gadget.

*Place Laminated ten frames and counters in bags. Ensure all students have their own set of counters and there are two sets of 10 counters with different shades e.g. green and red.

Store individually in zip lock bags or containers.
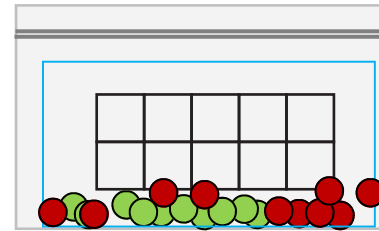
**Set the Ten Frames Gadget to these settings:**

**Tool Panel:** Check default settings
- Single ten frame
- Horizontal or vertical layout
- Set arrangement  pairs or rows

**Ten Frame**: single frame
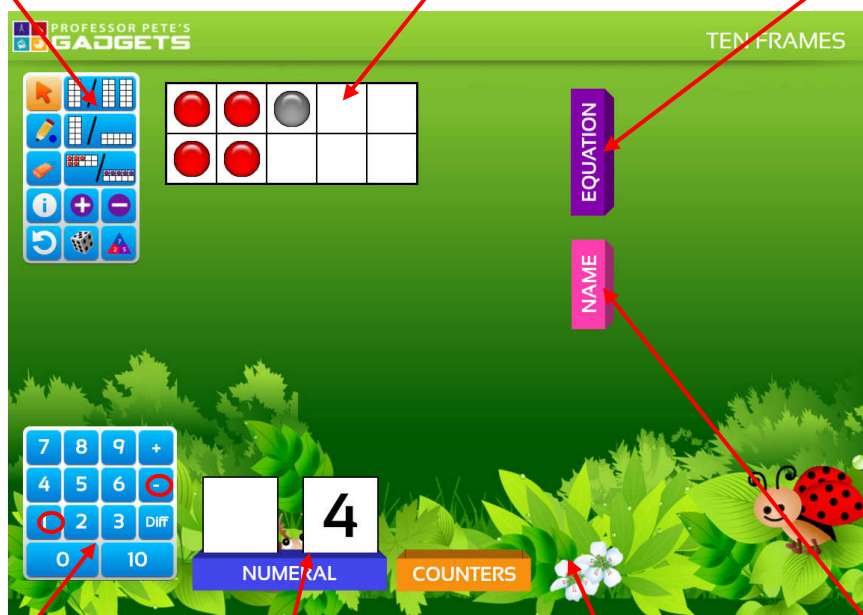
**EQUATION:** hide it (close it)

**Key Pad:** for entering numbers  e.g. "5 – 1"

**NUMERAL:** hide or show the written form of the number

**COUNTERS:** hide or show the counters on the ten frames

**NAME:** hide it (close it)

## Exploring the difference between:

**NOTE: Some students may not be ready for this more <u>difficult concept</u>. If so leave it till later, perhaps till the end of the Numbers to 10 course. Teacher discretion used be used here.**

**Difference between two numbers:**

- **Note:** The difference between is an excellent way for students to become efficient in subtraction number facts when the numbers close together. It is much more difficult for numbers further apart. These facts with numbers close together, (e.g. 9–7), can be more easily remembered as a difference between than trying to count back 7, requiring the use of fingers.

**Before using the Ten Frame Gadget**, it is important that students use their ten frames with counters. They will need two sets of 10 counters of different shades, e.g. green and red.

- Allow students to explore what the question "difference between" means. It means comparing. Some students may lie the counters side by side, others will mistake the wording "the difference between 5 **and** 4" and think it is addition and put the counters out as addition counters. Explore the wrong answer of 9 and help them understand that the difference between or comparing needs the two numbers laid next to each other and the difference is the ones left over.

## Using the Ten Frames Gadget to show the difference between:

- Close the EQUATION box as only the concept of difference between is being explored, not the written subtraction form as yet.
- Enter a large number in the keypad.
- Enter "Diff", then a number, one or two less. E.g. Difference between 9 and 8.
- Draw students attention to the two numbers 9 and 8 and where those numbers are in the image.
- Then identify the difference as being the one left over.
- Repeat with other numbers.

**Key Pad:**
enter 9 Diff 8

www.profepete.com
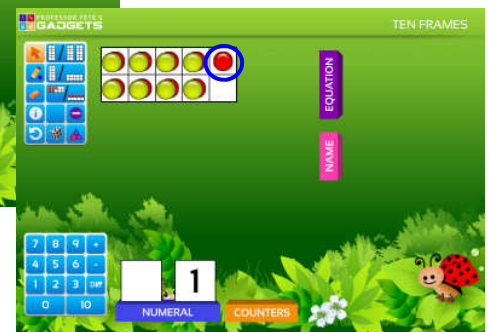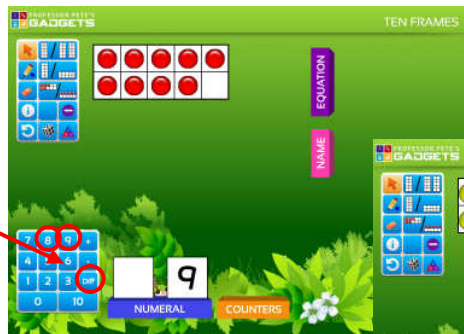
Use your ten frame. Put out 6 counters. Put 5 counters on top of them. What is the difference between them?

The difference between 6 and 5 is [1]

The difference between 5 and 3 is [ ]

The difference between 8 and 6 is [ ]

The difference between 4 and 3 is [ ]

The difference between 9 and 8 is [ ]

The difference between 2 and 0 is [ ]

The difference between 6 and 4 is [ ]

**Use your ten frame.**
**Put out 6 counters. Put 4 counters on top of them.**
**What is the difference between them?**

The difference between $\underline{6}$ and $\underline{4}$ is

| 2 |

Use the pairs layout for these.

The difference between $\underline{4}$ and $\underline{2}$ is

The difference between $\underline{8}$ and $\underline{6}$ is

The difference between $\underline{10}$ and $\underline{9}$ is

Use the rows layout for these.

The difference between $\underline{7}$ and $\underline{5}$ is

The difference between $\underline{8}$ and $\underline{7}$ is

The difference between $\underline{5}$ and $\underline{3}$ is
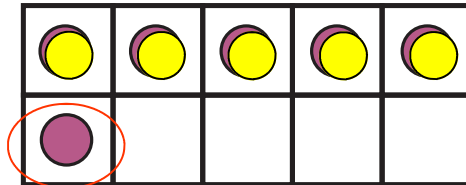
**PROFESSOR PETE'S GADGETS**
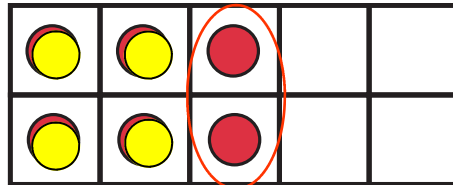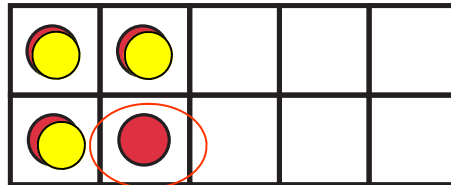
Use your ten frame. Put out 4 counters. Put 3 counters on top of them.
What is the difference between them?

The difference between 4 and 3 is [ 1 ]

The difference between 9 and 10 is [ ]

The difference between 6 and 8 is [ ]

The difference between 2 and 0 is [ ]

The difference between 5 and 4 is [ ]

The difference between 3 and 1 is [ ]

The difference between 7 and 5 is [ ]

# Lesson 4E

**The difference between two numbers.**

This concept is can also be illustrated using number lines.

Hand out laminated number lines.
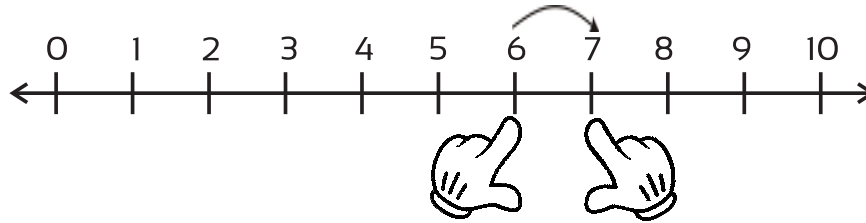


Ask students to find the first number on the line and point to it.

Then identify the second number on the line.

The difference is the number of hops in between them.

Try it with other numbers that have a difference of 2.
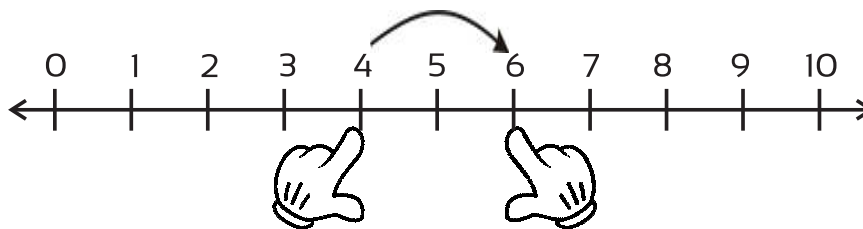


- **Worksheet activities:** Complete only some of them. Remember you do not need to do all the activities but choose the best ones most suitable for your students. Alternatively you could use the extra worksheets for early finishers.

**To use the number line to help you find the difference between 5 and 4, first circle 4 and then circle 5. The difference between them is one hop.**

0  1  2  3  4  5  6  7  8  9  10

The difference between __5__ and __4__ is  [ 1 ]

0  1  2  3  4  5  6  7  8  9  10

The difference between __8__ and __6__ is  [  ]

0  1  2  3  4  5  6  7  8  9  10

The difference between __7__ and __5__ is  [  ]

0  1  2  3  4  5  6  7  8  9  10

The difference between __4__ and __3__ is  [  ]

**PROFESSOR PETE'S GADGETS**

Use the number line to help you find the difference between these numbers. Find both numbers on the line and count the hops to get from number to number.

```
  0   1   2   3   4   5   6   7   8   9   10
←─┼───┼───┼───┼───┼───┼───┼───┼───┼───┼───┼→
```

The difference between **8** and **10** is [ ]

The difference between **4** and **6** is [ ]

The difference between **10** and **9** is [ ]

The difference between **1** and **3** is [ ]

The difference between **7** and **6** is [ ]

The difference between **6** and **4** is [ ]

The difference between **9** and **7** is [ ]

**Use the number line to help you find the difference between these numbers.**

0   1   2   3   4   5   6   7   8   9   10

The difference between  8 and 6  is

The difference between  5 and 4  is

The difference between  10 and 8  is

The difference between  1  and 2  is

The difference between  4  and 2  is

The difference between  6 and 7  is

The difference between  9 and 7  is

**PROFESSOR PETE'S GADGETS**

Use the number line to help you find the difference between these numbers. Find both numbers on the line and count the hops to get from number to number.

0  1  2  3  4  5  6  7  8  9  10

The difference between **8** and **6** is ☐

The difference between **0** and **2** is ☐

The difference between **10** and **8** is ☐

The difference between **5** and **4** is ☐

The difference between **8** and **7** is ☐

The difference between **9** and **7** is ☐

The difference between **2** and **4** is ☐

Use the number line to help you find the difference between these numbers. Find both numbers on the line and count the hops to get from number to number.

0  1  2  3  4  5  6  7  8  9  10

The difference between 9 and 8 is

The difference between 0 and 1 is

The difference between 9 and 7 is

The difference between 7 and 6 is

The difference between 6 and 8 is

The difference between 3 and 2 is

The difference between 8 and 7 is